

**Listing of claims:**

The following is a complete listing of all claims in the application, with an indication of the status of each:

- 1    1. (Currently Amended) A method to diagnose equipment failures using an  
2    integrated approach of case-based reasoning and reliability analysis,  
3    comprising the steps of:

4         collecting a statistical reliability data for each of a plurality of given  
5         equipments and for each of the hardware components of said equipment,  
6         said collecting including calculating a statistical average time between two  
7         successive failures of the equipment, calculating a statistical average time  
8         between successive two failures for each of said hardware components,  
9         calculating a statistical average time to repair failures of the equipment and  
10        calculating a statistical average time to repair failures of each of its hardware  
11        components;

12        constructing maintaining a case base database for each of the  
13        equipment, wherein each case based database record comprises at least four  
14        fields, including a failed equipment identifier field, a failed component  
15        identifier field, a failure description text field, and a solution record field;  
16        receiving an equipment problem description from a user, said  
17        description including a problem equipment identifier and a problem  
18        description text;

19        generating for each of said hardware components a conditional  
20        statistical probability of said component having a failed state given that the  
21        equipment identified by the user-input problem equipment identifier has a  
22        failed state, based on said collected statistical reliability data;

23        for each component in the equipment, calculating failure probability  
24        based on at least one of historical failure data and published failure data of  
25        the components;

26        matching the problem description test input by the user to the failure  
27        description text field of the case base database records to calculate for each  
28        component, calculating a case-based probability of for each of said hardware  
29        components associated with said failed state matching problem description  
30        assuming that a component fails, using case-based reasoning;  
31            for each component, combining the calculated probabilities to compute  
32        an overall failure probability given historical failure published failure data, and  
33        said problem description; and  
34            generating composing a list of component troubleshooting  
35        recommendations based on said generated conditional statistical probabilities  
36        and said calculated case base probabilities; and ranked by overall failure  
37        probabilities computed for each component and retrieving corresponding past  
38        solutions from said case base database  
39            displaying said list of generated troubleshooting recommendations.

2 -5 (Canceled).

1        6 (Currently Amended). A decision support system to diagnose equipment  
2        failures using an integrated approach of case-based reasoning and reliability  
3        analysis, comprising:

4            a statistical reliability database storing a statistical reliability data  
5        representing, for each of a plurality of given equipments and for each of the  
6        hardware components of said equipment, a statistical average time between  
7        two successive failures of the equipment, the statistical average time between  
8        two successive failures for each of its hardware components, the statistical  
9        average time to repair failures of the equipment and the statistical average  
10      time to repair failures of each of its hardware components;

11            a case base maintenance management system database for the  
12      equipment wherein each case base database record comprises at least four

13       fields, including a failed equipment identifier field, a failed component  
14       identifier field, a failure description text field, and a solution record field;  
15            a decision support system database;  
16            a decision support system client for receiving an equipment problem  
17        description from a user, said description including a problem equipment  
18       identifier and a problem description text;  
19            a decision support system server receiving input from the decision  
20        support system client and accessing said case base maintenance  
21        management system database and said decision support system database,  
22        said decision support system server including  
23            a real-time decision support system engine for calculating failure  
24        probability for each hardware component in the equipment, wherein said  
25       engine is  
26               arranged to receive an equipment problem description from a  
27       user, said description including a problem equipment identifier data  
28       and a problem description text;  
29               arranged to generate, for each of said hardware components a  
30       conditional statistical probability of said component having a failed  
31       state given that the equipment identified by the user-input problem  
32       equipment identifier has a failed state, based on said collected  
33       statistical reliability data;  
34               arranged to match the problem description test input by the user  
35       to the failure description text field of the case base database records to  
36       calculate a case-based probability for each of said hardware  
37       components associated with said failed state;  
38               arranged to generate a list of component troubleshooting  
39       recommendations based on said generated conditional statistical  
40       probabilities and said calculated case base probabilities,  
41       at least one of historical failure data and published failure data of each  
42       of the components, and for calculating a probability of matching said

43 equipment problem description for each component, assuming that a  
44 component fails, using case based reasoning, and for each component,  
45 combining said calculated probability of matching said equipment problem  
46 description for each component to compute an overall failure probability for  
47 each component given said at least one of the historical failure data and  
48 published failure data of each of the components and said equipment problem  
49 description and

50                   arranged to display said composing a list of component  
51                   troubleshooting recommendations ranked by overall failure said  
52                   generated conditional statistical probabilities and said calculated  
53                   case base probabilities computed for each hardware component, and  
54                   to retrieve retrieving corresponding past solutions from the case  
55                   base maintenance management system database; and  
56                   a case base update processor for copying closed failure transaction  
57 records from the case base maintenance management systems database,  
58 and extracting information from these transaction records to obtain attributes  
59 required by said real-time decision support system engine, and indexing each  
60 closed failure transaction record by a failed component identification and a  
61 number of occurrence of failure of that particular component.

7-10. (Canceled)